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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/607,922	06/30/2000	William Frederick Bosch	015290-426	9687

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BURNS DOANE SWECKER & MATHIS L L P
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

UMEZ ERONINI, LYNETTE T

ART UNIT	PAPER NUMBER
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1765

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DATE MAILED: 03/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/607,922

Applicant(s)

BOSCH, WILLIAM FREDERICK

Examiner

Lynette T. Umez-Eronini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 6, 7, 8, 9, 10, 11, 13, and 14; and 15, 17, and 19-30 rejected under 35 U.S.C. 102(b) as being Lu et al. (US 5,904,778).

Lu teaches a method of processing semiconductor substrates and reducing particle contamination during processing of the substrate, the method comprising the steps of:

loading a wafer that is supported on a pedestal in a vacuum (high density plasma oxide etcher) chamber that is made of silicon carbide (Figure 1; column 1, lines 20, 21, 24-27, and 36-40; Table 4; column 9, line 61 – column 10, line 24; and column 11, line 59 - column 12, line 5);

etching the wafer (silicon oxide overlying silicon or polysilicon and CVD SiC materials which can be applied to complex shapes) samples with a fluorocarbon plasma (column 1, lines 53-58 and column 7, lines 4-6, 53 and 54); and

inspecting these samples by a microscope after etching (Abstract; column 7, lines 22-24 and 40-45) read respectively on

(a) placing at least one substrate on a substrate holder in an interior space of a vacuum processing chamber, the processing chamber including at least one non-oxide

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ceramic part having a surface exposed to the interior space, the surface having been shaped and treated to reduce particles thereon by a high intensity plasma condition treatment;

(b) processing the at least one substrate by supplying process gas to the processing chamber; and

(c) removing the at least one substrate from the processing chamber.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 4, 5, 12, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lu (US 5,904,778) as applied to claims 1 and 15 above, and further in view of Wicker et al. (US 5,863,376).

Lu differs in failing to teach explicitly teach the

planar antenna, **in claims 2 and 16;**

treatment of the exposed surface with an oxygen gas into a plasma state, **in claim 12.**

recited process variables such as pressure of 200 to 500 mTorr and radio frequency power of 2000 to 25000 W, **in claims 4 and 18;** and

sequential treatment of no more than 50 wafers in the processing chamber, **in claim 5.**

Wicker teaches vacuum plasma processing chamber comprising:

a planar antenna **18** (column 6, lines 37 and 38);

a process of etching the wafers followed by ashing with O₂ (column 5, lines 13-1518), which reads on treating the exposed surface with an oxygen gas is a plasma state

a vacuum pressure at below 300 mTorr and radio frequency bias at less than 2200 watts (column 5, lines 59-61); and

a sequential method of processing of 25 wafers in the chamber (column 5, lines 5 and 6).

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Lu by using the planar antenna, oxygen gas in the processing chamber, process parameters, and sequential treatment of no more than 50 wafers in the processing chamber as taught by Wicker for the purpose of minimizing the quality of the processed substrate during sequential batch processing of substrates (Abstract).

Lu differs if failing to explicitly teach conditioning the exposed surface of the ceramic part to lower particle counts measured by a particle counter to below 20 particles, **in claim 5.**

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to employ any of a variety of processing steps and variables such as those claimed by the applicant. They are well known in the etching art and known to affect both the rate and quality of the polishing process. The selection of a particular value would be optimized by conducting routine experimentation for purpose of minimizing the quality of the processed substrate during sequential batch processing of substrates (Abstract). Changes in temperature, concentrations, or other process conditions of an old process do not impart patentability unless the recited ranges are critical, i.e., they produce a new and unexpected result. *In re Aller et al.*, 105 USPQ 233.

Response to Arguments

5. Applicant's arguments filed December 18, 2002 have been fully considered but they are not persuasive. Applicant argues the 102 rejection of claims 1 and 15 in view of Lu ('778) and the 103 rejection of claims 2, 4, 5, 12, 16, and 18 in view of Lu ('778) and Wicker ('376) for failing to disclose any conditioning treatment of CVD SiC. Applicant's argument is unpersuasive because Lu teaches a wafer that is supported on a pedestal in a vacuum (high density plasma oxide etcher) chamber that is made of silicon carbide (Figure 1; column 1, lines 20, 21, 24-27, and 36-40; column 4, lines 29-32; Table 4; column 9, line 61 – column 10, line 24; and column 11, line 59 - column 12, line 5); is etched with a fluorocarbon plasma (column 1, lines 53-58 and column 7, lines 4-6, 53 and 54). Since Lu's uses the same etching method, chamber and etchant to etch the

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same material as those of the claimed invention, then using Lu's etching method would inherently read on conditioning treatment of CVD SiC.

Applicant further argues that Lu ('778) in view of Wicker ('376) fails to disclose or suggest a conditioning treatment such as "the surface layer is oxidized and the oxide layer is optionally removed in a manner which reduces the number of attached particles" (specification: page 7, lines 7-9). Applicant argument is unpersuasive because the said conditioning treatment is not claimed.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 703-306-9074. The examiner can normally be reached on First Friday.

ltue

March 1, 2002

A handwritten signature in cursive script, likely belonging to Lynette T. Umez-Eronini, located in the lower right quadrant of the page.